

## PATENT ABSTRACTS OF JAPAN

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(21) Application number : 04-093417 (71) Applicant : VICTOR CO OF JAPAN LTD

(22) Date of filing : 19.03.1992 (72) Inventor : NAKANO HIDEMI

### (54) DIGITAL AUDIO RECORDING/REPRODUCING SYSTEM

#### (57) Abstract:

PURPOSE: To copy a digital audio signal.  
CONSTITUTION: At the time of recording, copy data different from the copy data of an SCM system to be recorded on a recording medium is operated based on the category information and the copy information of the digital audio signal. At the time of reproduction, the category information and the copy information are operated by the copy data.

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CLAIMS

[Claim(s)]

[Claim 1] The digital audio play back system which is a digital audio play back system which carries out record playback of the digital audio signal of digital audio interface specification, and is characterized by to operate different copy data from the copy data of the SCMS method which should be recorded on a record medium based on the category information and the copy information on said digital audio signal, and to operate said category information and copy information with said copy data at the time of playback at the time of record.

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## DETAILED DESCRIPTION

### [Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the digital audio play back system concerning the DESHITARU copy which used the so-called S-VHS method digital audio VTR, for example.

[0002]

[Description of the Prior Art] As a standard which transmits a signal between digital audio equipment, there is "digital audio interface" (CP-340, corporation Electronic Industries Association of Japan (EIAJ), September, 1987 establishment).

[0003] Drawing where drawing 16 explains a format of the subframe in a digital audio interface, drawing where drawing 17 explains a format of the frame in a digital audio interface, and drawing 18 R> 8 are drawings explaining the channel status data format (Type II) in a digital audio interface.

[0004] The digital audio signal of digital audio interface specification consists of a subframe, a frame, and a block. The subframe consists of time slots 0-31 of 32, as shown in drawing 16 R> 6. As shown in drawing 17 , a frame is the train of a subframe and constitutes one frame from a two-channel stereo by two subframes. A block is a frame which 192 follows and transmits the 192 bit 1-word channel status by making 1 block into a unit.

[0005] As shown in drawing 16 , the time slots 0-3 which constitute a subframe are used for transmission of a synchronous preamble, and this preamble is used for the extract of periods, such as a subframe, a frame, and a block.

[0006] The time slots 4-7 are used for transmission of the audio sample WORD when

making audio OGUVIJYARI information or audio sample WORD into 24 bits. Without audio OGUVIJYARI, when the bit length of audio sample WORD is 20 bits or less, the time slots 4-7 are set to "0."

[0007] The time slots 8-27 are used for transmission of audio sample WORD. MSB of audio sample WORD is put on the time slot 27 regardless of the word length. LSB of audio sample WORD is put on the time slot 8 at the time slot 4, when the word length is 20 bits, and the word length is 24 bits. When there is less word length of audio sample WORD than 20 bits, only the part of few bits sets the LSB side to "0."

[0008] The time slot 28 is used for transmission of a PARIDITI flag. The data of the audio sample WORD to transmit set a PARIDITI flag to "0" at the time of the right, and when having mistaken, they set it to "1." Use of a PARIDITI flag is arbitrary, and when not using it, it is set to "0."

[0009] The time slot 29 is used for transmission of user data, and the time slot 30 is used for transmission of the channel status, respectively.

[0010] The time slot 31 is used for transmission of a parity bit. Parity is the time slots 4-31 except a preamble, and is even parity.

[0011] A frame is constituted from transmission of a two-channel stereo by two subframes, and the transmission rate of this frame is the same as the sampling rate of the source.

[0012] The above-mentioned channel status is explained. 1 bit of channel statuses exists at a time in one frame.

[0013] Since 1 block is 192 frames (a frame 0 - frame 191) as described above, the channel status transmits 192 bits and it as 1 word by 1 block.

[0014] The channel status has three kinds (Type I, the type II form I, type II form II) according to the contents of transmission information. The thing and Type II with which Type I transmits the information for broadcasting station studio transmit the information for noncommercial digital audio equipment (form I), or the information for music title production (form II), it is Type II .. that discernment .. the bit 1 of channel status WORD .. carrying out .. Type I"1 .. 0 .. " .. it is . In the following explanation, it carries out only about Type II.

[0015] The channel status data format (Type II) consists of 192 bits per block, as shown in drawing 18.

[0016] A bit 0 "0" which shows Type II, a bit 1 - a bit 5 "Control", Bits 6 and 7 the "mode", a bit 8 (LSB) - a bit 15 (MSB) "A category code", A bit 16 (LSB) - a bit 19 (MSB) the "source", a bit 20 (LSB) - a bit 23 (MSB) "A channel number", A bit 24 - a bit 27 a "sampling frequency" and bits 28 and 29 "Clock precision", Bits 30 and 31 "00", a bit 32

(MSB) - a bit 39 (LSB) "Code form", A bit 40 - a bit 91 "UPC/EAN code N1 - N13". As for "0000000000000000 00000", the bit 116 - the bit 175, each information on "0000000000000000" is stored for the bit 92 - the bit 115, respectively, as for "ISRC 11.112", the bit 176 - the bit 192.

[0017] And "control" information on the above-mentioned bit 1 - a bit 5 is defined as follows.

"0X000" Two-channel audio (with no pre-emphasis)

"0X100" Two-channel audio (those of 50/15microsec with pre-emphasis)

"0X010" Hold (for two-channel audios with pre-emphasis)

"0X110" Hold (for two-channel audios with pre-emphasis)

"0XXX1" Hold (for four-channel audios)

"1X000" Digital data "1X1XX" Hold "1XX1X" Hold "1XXX1" Hold "X0XXX" Ban on a digital copy (henceforth the ban on a copy)

"X1XXX" Digital copy authorization (hencefor copy authorization)

Moreover, the main things of the "category code" information on the above-mentioned bit 8 - a bit 15 are defined as follows.

"00000000" General two-channel format "1 million" Two-channel CD player (CD)

"0100000L" Two-channel PCM encoder decoder "1000001L" Two-channel digital audio recorder (DAT) "1101000L" Two-channel digital video recorder (D. VTR)

"L" which is LSB of the above-mentioned "category code" .. this bit .. "0" .. it is and it is shown that there is that it is in one condition of "1." For example, "1101000L" shows "1101000" and "11010001."

[0018] Now, in recording on a tape the digital audio signal which suited the "digital audio interface" specification mentioned above with a serial copy management system (SCMS, Serial Copy Management System), it supplies DAT through the digital input terminal. Under the present circumstances, each information on a synchronous preamble, audio OGUJTRYARI, a validity flag, user data, the channel status, and a parity bit is also transmitted besides the original audio data stored in the audio sample WORD in a subframe.

[0019] And 8 bits (code which specifies a device) of category codes, the copy bit (the 2nd bit under "control") in the channel status Using "ban on copy" information ("0XXX"= "0"), and 1 bit ("X1XXX"= "1") of "copy authorization" information, the copy data (an ID code, ID6) recorded on a tape are operated, and it changes into a condition possible [ record ] or unrecordable.

[0020] Now, now, the pattern of the ID code in DAT is the following three kinds.  
"00" Any number of times are copy authorization "10". It is the ban "11" on a copy from the input signals like DAT at the time of digital signal record As copy data recorded on a

now on. The category code and copy code of a digital audio signal which read this ID code and DAT itself outputs will be operated once from now on at the time of copy authorization playback. Namely, (1) When an ID code "00" is reproduced, they are category code = "11 million" and a copy bit. It considers as = "1" (copy authorization).  
(2) When an ID code "10" is reproduced, they are category code = "11 million" and a copy bit. It considers as = "0" (ban on a copy).  
(3) When an ID code "11" is reproduced, they are category code = "11000001" and a copy bit. It considers as = "0".

[0021] (1) described above when DAT tended to be connected and it was going to copy this .. (3) from .. the ID code of the copy data judged and recorded is operated further, and it changes into a condition possible [ record ] or unrecordable. [ furthermore, ]

[0022]

[Problem(s) to be Solved by the Invention] By the way, although using the ID code of the SCMS method correspondence DAT on condition of the above-mentioned digital audio interface specification as copy data was performed widely, by this approach, there was a case where a digital audio signal could not be copied to other devices from DAT.

[0023]

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, this invention offers the digital audio play back system of a configuration of carrying out the following.

[0024] The digital audio play back system which is a digital audio play back system which carries out record playback of the digital audio signal of digital audio interface specification, and is characterized by to operate different copy data from the copy data of the SCMS method which should be recorded on a record medium based on the category information and the copy information on said digital audio signal, and to operate said category information and copy information with said copy data at the time of playback at the time of record.

[0025]

[Example] Hereafter, the digital audio play back system which becomes this invention is explained along with drawing 1 - drawing 15 . Drawing 1 is drawing explaining the digital copy of the digital audio play back system which becomes this invention.

[0026] The digital audio play back system which becomes this invention A profile, for example, the SCMS method of DAT mentioned above, is a different method. It is a copy method peculiar to the S-VHS method digital audio VTR. In 8 bits (bits 8-15) of category codes and 1 bit (bit 1 of the control bits) of copy codes contained in the channel status of the input signals like DAT at the time of digital signal record As copy data recorded on a

tape, ID-7 of a S-VHS method digital audio and an ID code format are operated. Read the above-mentioned ID-7 currently recorded on the tape at the time of playback, and with the digital audio data according to digital audio interface specification to the exterior. Following (1) - (3) The category code and copy code which are contained in the channel status reproduced by the playback condition of ID-7 which are copy data like are operated.

(1) When ID-7= "00" is reproduced, it is a category code ="11010000" (D. VTR) copy code. It considers as = "1" (copy authorization).

(2) the case where ID-7"10" is reproduced .. category code ="11010000" and copy code It considers as = "0" (ban on a copy).

(3) the case where ID-7"11" is reproduced .. category code ="11010001" and copy code It considers as = "0."

Here, 2 bits of the bits 7 and 6 in a S-VHS method digital audio and an ID code format are used for ID-7.

[0027] Furthermore, it is (1) described above when DAT tended to be tied to this digital audio VTR and it was going to copy now. (3) Judging from a condition, ID6 is operated further and it changes into a condition possible [ record ] or unrecordable.

[0028] Along with drawing 1 - drawing 9, it explains having mentioned above further.

[0029] Drawing 1 shows the correspondence of ID-7 and a group recorded on the class of digital audio input signal (source), a category code, a copy code, and a tape.

[0030] The input signal (source) includes the category code and the copy code, and is reproduced from "GENERAL" (digital audio equipment, such as a new style broadcasting satellite tuner), the "undefined", "a semi-conductor recorder" (digital audio equipment using semiconductor memory), "BS" (satellite broadcasting service tuner), "PDD CONVERTER and a PCM processor", "AD CONVERTER", "CD", "a digital musical instrument and a digital microphone", and "DAT." And this input signal (source) is classified into five groups of Group A - group D'. This classification is the same as that of the group whom DAT has classified according to SCMS in a category code.

[0031] A group is Group A (device of the category code of the undefined). They are illustration, Group B (category codes are others [ AD converter / the device (it corresponds to a new style broadcasting satellite tuner and drawing 3 ) of General, and ]), and Group C (category codes are others [ VTR / DAT and / D.A.] ) to drawing 2 .

They are correspondence, Group D (category codes are others [ broadcasting satellite tuner / CD (it corresponds to drawing 7 and 8), and / old mold ]), and group D' (device from which a copy prohibition bit changes [ a category code ] with "0", "1", "0", "1", and .. with CD.) to drawing 4 - drawing 6 R> 6. It is classified into illustration at drawing 9 .

[0032] Group A is copied as shown in drawing 2 .

[0033] As shown in this drawing (A), the category code of the input signal from the device of the undefined is a category code "000000100" (undefined)+ copy code "0" (ban on a copy). In case this is copied with the digital audio VTR of the next step (D. A.VTR), D.A.VTR records this signal, after setting to "11" (1-time copy authorization) ID-7 which are a copy code according to the condition of these category codes and copy codes. Then, when D.A.VTR reproduces ID-7 of "11" (1-time copy authorization). The signal of a category code "11010001" (D. VTR)+ copy code "0" (ban on a copy) is outputted. this .. the next step .. DAT .. copying .. the time .. DAT .. these .. a category .. a code .. a copy .. a code .. a condition .. responding .. a copy .. a code .. it is .. ID .. six .. " .. ten .. " (ban on a copy) .. \*\* .. having carried out .. a top .. this signal .. recording . Since the signal of a category code "11 million" (DAT)+ copy code "0" (ban on a copy) is outputted when Above DAT furthermore reproduces ID6 of "10" (ban on a copy) after this, it cannot copy in DAT which carries out direct continuation to this.

[0034] If it is made the circuitry which removed the above-mentioned D.A.VTR, as shown in this drawing (B), the signal from the device of the undefined can be copied only in DAT which carried out direct continuation to this.

[0035] Here, during the circuitry shown in this above-mentioned drawing (A), if the copy code of the signal from the device of the undefined is set to "1" (copy authorization) from "0" (ban on a copy), as shown in this drawing (C), a total of 1 time and two copies will be made to D.A.VTR and this in DAT which carries out direct continuation, respectively.

[0036] During the configuration which similarly is shown in this above-mentioned drawing (B), if the copy code of the signal from the device of the undefined is set to "1" (copy authorization) from "0" (ban on a copy), as shown in this drawing (D), it can copy only in DAT which carried out direct continuation to the device of the undefined. As described above, by the SCMS method by the category code of the source carrying out direct continuation of the device and DAT of the undefined, it can copy only once by DAT, but if insertion connection of the D.A.VTR is made among both, it will be set possible to D.A.VTR by a unit of 1 time by DAT by total of two copying.

[0037] Group B is copied as shown in drawing 3 . Here, a new style broadcasting satellite tuner is explained as an example.

[0038] As shown in this drawing (A), the input signal from the broadcasting satellite tuner whose category code is General is a category code "00000000" (general two-channel format)+ copy code "0" (ban on a copy), and in case this is copied with D.A.VTR of the next step, D.A.VTR records this input signal, after setting ID-7 to "11" (1-time copy authorization). Then, when D.A.VTR reproduces ID-7 of "11" (1-time copy

authorization), in case the signal of a category code "11010001" (D. VTR.P)+ copy code "0" (ban on a copy) is outputted and this is copied by DAT of the next step, DAT records this signal, after setting ID6 to "10" (ban on a copy). Since the signal of a category code "11 million" (DAT)+ copy code "0" (ban on a copy) is outputted when DAT furthermore reproduces ID6 of "10" (ban on a copy) after this, latter DAT cannot be copied.

[0039] In case the signal from a broadcasting satellite tuner will be copied by DAT which carries out direct continuation to this as shown in this drawing (B) if it is made the circuitry which removed the above-mentioned D.A.VTR, DAT records this signal, after setting ID6 to "11" (1-time copy authorization). Then, since the signal of a category code "11000001" (DAT)+ copy code "0" (ban on a copy) is outputted when DAT reproduces ID6 of "11" (1-time copy authorization), latter DAT records this signal, after setting ID6 to "10" (ban on a copy). Since the signal of a category code "11 million" (DAT)+ copy code "0" (ban on a copy) is outputted when latter DAT furthermore reproduces ID6 of "10" (ban on a copy) after this, DAT following this cannot be copied.

[0040] the copy code of the signal from the broadcasting satellite tuner shown in this above-mentioned drawing (A) and (B) here, respectively .. "0" (ban on a copy) to "1" (copy authorization) .. even if .. As shown in this drawing (C), a total of 1 time and two copies is made in DAT as D.A.VTR, respectively, and as shown in this drawing (D), only in DAT of the preceding paragraph, it can only copy.

[0041] Group C is copied as shown in drawing 4 and drawing 5, respectively. Here, the case where DAT is used as the source is shown.

[0042] As shown in drawing 4 (A), the signal from DAT which a category code is DAT and is ID6 "10" (ban on a copy) is a category code "11 million" (DAT)+ copy code "0" (ban on a copy), and in case this is copied with D.A.VTR records this input signal, after setting ID-7 to "10" (ban on a copy). Then, since the signal of a category code "11010000" (D. VTR)+ copy code "0" (ban on a copy) is outputted when D.A.VTR reproduces ID-7 of "10" (ban on a copy), DAT of the next step cannot be copied.

[0043] If it is made the circuitry which removed the above-mentioned D.A.VTR, as shown in this drawing (B), the signal from DAT cannot be copied by DAT by which direct continuation is carried out to this.

[0044] While setting to "00" (copy authorization) ID6 of DAT which is the source from "10" (ban on a copy) during the circuitry shown in this above-mentioned drawing (A) and (B) here, respectively. If the copy code of the input signal from here is set to "1" (copy authorization) from "0" (ban on a copy), as shown in this drawing (C) and (D), respectively, a copy can do the output signal of DAT which is the source any number of times.

[0045] Similarly, a category code is DAT as shown in drawing 5 (A). The signal from DAT which is ID6 "11" (1-time copy authorization) is a category code "11000101" (DAT)+ copy code "0" (ban on a copy). In case this is copied with D.A.VTR of the next step, D.A.VTR records this input signal, after setting ID-7 to "11" (1-time copy authorization). Then, in case it copies by DAT of the next step since the signal of a category code "11000001" (D. VTR)+ copy code "0" (ban on a copy) is outputted when D.A.VTR reproduces ID-7 of "11" (1-time copy authorization), DAT records this signal, after setting ID6 to "10" (ban on a copy). Since the signal of a category code "11 million" (DAT)+ copy code "0" (ban on a copy) is outputted when DAT furthermore reproduces ID6 of "10" (ban on a copy) after this, latter DAT cannot be copied.

[0046] If it is made the circuitry which removed the above-mentioned D.A.VTR, as shown in this drawing (B), the signal from DAT which is a source side can only be copied by DAT by which direct continuation is carried out to this.

[0047] Here, when setting to "1" (copy authorization) the copy code of the signal from DAT which is ignorance [ ID6 of DAT which is the source ], and the circuitry shown in this above-mentioned drawing (A), and a source side ], and the source from "0" (ban on a copy), as shown in this drawing (C), a copy is made any number of times after the next step of this DAT.

[0048] During the configuration shown in this above-mentioned drawing (B), when setting to "1" (copy authorization) ignorance [ ID6 of DAT which is the source ], and the copy code of the signal of DAT from "0" (ban on a copy), as shown in this drawing (D), a copy is made any number of times in DAT.

[0049] Similarly, Group C is copied as shown in drawing 6.

[0050] As shown in this drawing (A), when D.A.VTR whose category code is D.VTR reproduces ID-7 of "10" (ban on a copy), The signal from here is a category code "11010000" (D. VTR)+ copy code "0" (ban on a copy), and in case this is copied with D.A.VTR of the next step, this D.A.VTR records this input signal, after setting ID-7 to "10" (ban on a copy). Then, when D.A.VTR reproduces ID-7 of "10" (ban on a copy), the signal of a category code "11010000" (D. VTR)+ copy code "0" (ban on a copy) is outputted, and this signal is recorded after D.A.VTR of the next step sets ID-7 to "10" (ban on a copy) for this. In this way, if the source is D.A.VTR, it can copy any number of times.

[0051] As shown in this drawing (B), when D.A.VTR reproduces ID-7 of "00" (copy authorization), the signal from here is a category code "11010000" (D. VTR)+ copy code "1" (copy authorization), and after ID-7 of D.A.VTR of the next step set this to "00" (ban on a copy), this input signal is recorded. Then, when D.A.VTR reproduces ID-7 of "00"

(ban on a copy), the signal of a category code "11010000" (D. VTR)+ copy code "1" (copy authorization) is outputted, and this signal is recorded after D.A.VTR of the next step sets ID-7 to "00" (ban on a copy) for this. In this way, if the source is D.A.VTR, it can copy any number of times.

[0052] As shown in this drawing (C), when D.A.VTR reproduces ID-7 of "11" (1-time copy authorization), The signal from here is a category code "11010001" (D. VTR)+ copy code "0" (ban on a copy), and after ID-7 of D.A.VTR of the next step set this to "11" (1-time copy authorization), this input signal is recorded. Then, when D.A.VTR reproduces ID-7 of "11" (1-time copy authorization), the signal of a category code "11010001" (D. VTR)+ copy code "0" (ban on a copy) is outputted, and this signal is recorded after setting ID-7 to "11" (1-time copy authorization) for this with D.A.VTR of the next step. In this way, if the source is D.A.VTR, it can copy any number of times.

[0053] As shown in this drawing (D), ID-7 of D.A.VTR by the side of the source are unknown, this output signal is a category code "11010001" (D. VTR)+ copy code "1" (copy authorization), and after ID-7 of D.A.VTR of the next step set this to "00" (copy authorization), this input signal is recorded. Then, when D.A.VTR reproduces ID-7 of "00" (copy authorization), the signal of a category code "11010000" (D. VTR)+ copy code "1" (copy authorization) is outputted, and this signal is recorded after setting ID-7 to "00" (copy authorization) for this with D.A.VTR of the next step. In this way, if cascade connection of the D.A.VTR is carried out, it can copy any number of times.

[0054] If the source is D.A.VTR and all the devices following this are D.A.VTRs as described above, it can copy any number of times.

[0055] Group D is copied as shown in drawing 7.

[0056] As shown in this drawing (A), the signal from CD whose category code is CD is a category code "10 million" (CD)+ copy code "0" (ban on a copy), and in case this is copied with D.A.VTR of the next step, D.A.VTR records this input signal, after setting ID-7 to "11" (1-time copy authorization). Then, when D.A.VTR reproduces ID-7 of "11" (1-time copy authorization), the signal of a category code "11010001" (D. VTR)+ copy code "0" (ban on a copy) is outputted, and this signal is recorded after setting ID6 to "10" (ban on a copy) for this by DAT of the next step. Since the signal of a category code "11 million" (DAT)+ copy code "0" (ban on a copy) is outputted when DAT furthermore reproduces ID6 of "10" (ban on a copy) after this, latter DAT cannot be copied.

[0057] If it is made the circuitry which removed the above-mentioned D.A.VTR, as shown in this drawing (B), the signal from CD will be copied only in DAT which carries out direct continuation to this.

[0058] Here, during the circuitry shown in this above-mentioned drawing (A) and (B),

respectively, when the copy code of the signal from CD is set to "1" (copy authorization) from "0" (ban on a copy), as shown in this drawing (C) and (D), respectively, a copy is made any number of times.

[0059] Similarly, as shown in drawing 8 (A), the output signal from CD which is the category code CD is a category code "10000001" (CD)+ copy code "0" (ban on a copy), and in case this is copied with D.A.VTR of the next step, D.A.VTR records this input signal, after setting ID-7 to "10" (ban on a copy). Then, since the signal of a category code "11010000" (D. VTR)+ copy code "0" (ban on a copy) is outputted when D.A.VTR reproduces ID-7 of "10" (ban on a copy), latter DAT cannot be copied.

[0060] If it is made the circuitry which removed the above-mentioned D.A.VTR, as shown in this drawing (B), the signal from CD cannot be copied.

[0061] Here, during the circuitry shown in this above-mentioned drawing (A) and (B), respectively, if the copy code of the signal from CD is set to "1" (copy authorization) from "0" (ban on a copy), as shown in this drawing (C) and (D), respectively, it can copy any number of times.

[0062] Group D is copied as shown in drawing 9.

[0063] As shown in this drawing (A), the output signals from CD whose category code is CD are category code "10 million" (CD)+ "0", "1", "0", "1", ..., a copy code that changes by 4.10Hz. In case this is copied with D.A.VTR of the next step, D.A.VTR records this input signal, after setting ID-7 to "10" (ban on a copy). Then, since the signal of a category code "11010000" (D. VTR)+ copy code "0" (ban on a copy) is outputted when D.A.VTR reproduces ID-7 of "10" (ban on a copy), latter DAT cannot be copied.

[0064] If it is made the circuitry which removed the above-mentioned D.A.VTR, as shown in this drawing (B), the signal from CD cannot be copied.

[0065] Below, above-mentioned S-VHS method digital audio and ID code format are explained.

[0066] Drawing in which drawing 10 shows track format, and drawing 11 are drawings explaining the sampling of an input audio signal.

[0067] As shown in drawing 10, voice data can distribute to the even audio track (lower layer of the video track of a channel 1) 7, and the od audio track (lower layer of the video track of a channel 2) 8, and is recorded one by one in the direction of slant by turns to the direction of a tape feed by the BIRTEO head which is not illustrated on a tape 6.

[0068] As the even Audie track 7 is shown in drawing 11, it consists of sample data E01, E00, E02, E01, and E03 which carried out the sequential sampling and obtained the input audio signal, the od audio track 8 consists of sample data E02, E04, E03, E10, and E04, and the even Audie track 9 consists of sample data E11, E10, E12, E11, and E13.

[0069] The 1 above-mentioned sample data consists of one subframes (from data DAT A and Q to a configuration) 10, and the one above-mentioned audio track consists of five subframes.

[0070] Drawing 12 is drawing showing the data format per one track.

[0071] As shown in this drawing, each above-mentioned tracks 7 and 8 and above-mentioned 9 .. consist of 156 blocks ("preamble" 4 blocks, "data area" 150 block, "postamble" 2 block). "Data area" 150 blocks consists of five subframes. One subframe consists of 30 blocks. And the subframe concerning od sample data and the subframe concerning even sample data constitute one data frame.

[0072] Drawing 13 is drawing showing the data format per block.

[0073] In 30 block 0-0-0-29 which constitute one subframe as shown in this drawing The inside of the even block addresses 0-0, 0-2, .., 1 block which 0-28 becomes from 35 symbols (280 bits), One by one, it consists of "sink pattern (SYNC)" 1 symbol, "address (ADR) and W1" 1 symbol, "ID, W2" 1 symbol, "parity (PARITY) and P"1 symbol, and "data" 31 symbol, respectively.

[0074] Moreover, it consists of "sink pattern (SYNC)" 1 symbol, "address (ADR) and W1" 1 symbol, "ID, W2" 1 symbol, "parity (PARITY) and P"1 symbol, "data" 23 symbol, and "C1 parity" 8 symbol one by one, respectively among the odd block addresses 0-1, 0-3, .., 1 block which 0-29 becomes from 35 symbols (280 bits).

[0075] Drawing in which drawing 14 shows an ID code format, and drawing 15 are drawings showing the contents of a convention of ID-1-ID-10.

[0076] As shown in drawing 14, "the address (ADR) and W1" which were shown by drawing 13 consist of B7-B0, and "ID, W2" consist of B7-B0. [ 8-bit ] [ 8-bit ]

[0077] When "the address (ADR) and W1" (block address) are "XXXXX(6/000", ID-1 data (format convention data), its bit B5, and B4 of the bit B7 of "ID, W2" and B6 are the contents of a convention of ID-2 data (sampling-frequency convention data).

[0078] Moreover, W1 It is W2 when it is "XXXXX010". ID-3 data (channel convention data), its bit B5, and B4 of a bit B7 and B6 are the contents of a convention of ID-4 data (channel convention data).

[0079] ID-1 specifies a format and it is specified as the object for audios at the time of "00." As mentioned above, no matter the category code and copy code of the source may be in what condition, always is possible for the copy in D.A.VTR.

[0080] Moreover, if it is D.A.VTRs, a copy will become possible any number of times.

[0081] Furthermore, except for some category codes, DAT carries out actuation (actuation which records the same copy data on a tape when it cannot copy and copy improper and a copy are possible) same as a SCMS method to the same source by the

case where it is going to copy to DAT directly, and the case where this tended to be reproduced and it is going to copy it to DAT once it copied to D.A.VTR.

[0082]

[Effect of the Invention] The digital audio play back system which becomes this invention has the effectiveness which can cancel that a digital audio signal may be unable to be copied to other devices by the SCMS method of DAT on condition of the above-mentioned digital audio interface specification.

[Translation done.]

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TECHNICAL FIELD

[Industrial Application] This invention relates to the digital audio play back system concerning the DESHITARU copy which used the so-called S-VHS method digital audio VTR, for example.

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## PRIOR ART

4.31 except a preamble, and is even parity.

[0011] A frame is constituted from transmission of a two-channel stereo by two subframes, and the transmission rate of this frame is the same as the sampling rate of the source.

[Description of the Prior Art] As a standard which transmits a signal between digital audio equipment, there is "digital audio interface" (CP-340, corporation Electronic Industries Association of Japan (EIAJ), September, 1987 establishment).

[0003] Drawing where drawing 16 explains a format of the subframe in a digital audio interface, drawing where drawing 17 explains a format of the frame in a digital audio interface, and drawing 18 R> 8 are drawings explaining the channel status data format (Type II) in a digital audio interface.

[0004] The digital audio signal of digital audio interface specification consists of a subframe, a frame, and a block. The subframe consists of time slots 0-31 of 32, as shown in drawing 16 R> 6. As shown in drawing 17, a frame is the train of a subframe and constitutes one frame from a two-channel stereo by two subframes. A block is a frame which 192 follows and transmits the 192-bit 1-word channel status by making 1 block into a unit.

[0005] As shown in drawing 16, the time slots 0-3 which constitute a subframe are used for transmission of a synchronous preamble, and this preamble is used for the extract of periods, such as a subframe, a frame, and a block.

[0006] The time slots 4-7 are used for transmission of the audio sample WORD when making audio OGUJJIRYARI information or audio sample WORD into 24 bits. Without audio OGUJJIRYARI, when the bit length of audio sample WORD is 20 bits or less, the time slots 4-7 are set to "0".

[0007] The time slots 8-27 are used for transmission of audio sample WORD. MSB of audio sample WORD is put on the time slot 27 regardless of the word length. LSB of audio sample WORD is put on the time slot 8 at the time slot 4, when the word length is 20 bits, and the word length is 24 bits. When there is less word length of audio sample WORD than 20 bits, only the part of few bits sets the LSB side to "0".

[0008] The time slot 28 is used for transmission of a PARIDITI flag. The data of the audio sample WORD to transmit set a PARIDITI flag to "0" at the time of the right, and when having mistaken, they set it to "1." Use of a PARIDITI flag is arbitrary, and when not using it, it is set to "0."

[0009] The time slot 29 is used for transmission of user data, and the time slot 30 is used for transmission of the channel status respectively.

[0010] The time slot 31 is used for transmission of a parity bit. Parity is the time slots

[0012] The above-mentioned channel status is explained. 1 bit of channel statuses exists at a time in one frame.

[0013] Since 1 block is 192 frames (a frame 0 - frame 191) as described above, the channel status transmits 192 bits and it as 1 word by 1 block.

[0014] The channel status has three kinds (Type I, the type II form I, type II form II) according to the contents of transmission information. The thing and Type II with which Type I transmits the information for broadcasting station studio transmit the information for noncommercial digital audio equipment (form I), or the information for music title production (form II). It is Type I or is Type II -- that discernment -- the bit 1 of channel status WORD -- carrying out ... Type I"1 ... 0 ..." it is . In the following explanation, it carries out only about Type II.

[0015] The channel status data format (Type II) consists of 192 bits per block, as shown in drawing 18.

[0016] A bit 0 "0" which shows Type II, a bit 1 - a bit 5 "Control", Bits 6 and 7 the "mode", a bit 8 (LSB) - a bit 15 (MSB) "A category code", A bit 16 (LSB) - a bit 19 (MSB) the "source", a bit 20 (LSB) - a bit 23 (MSB) "A channel number", A bit 24 - a bit 27 a "sampling frequency" and bits 28 and 29 "Clock precision", Bits 30 and 31 "00", a bit 32 (MSB) - a bit 39 (LSB) "Code form", A bit 40 - a bit 91 "UPC/EAN code N1 - N13". As for "0000000000000000000000", the bit 116 - the bit 175, each information on "0000000000000000" is stored for the bit 92 - the bit 115, respectively, as for "ISRC 11-12", the bit 176 - the bit 192.

[0017] And "control" information on the above-mentioned bit 1 - a bit 5 is defined as follows.

"0X000" Two-channel audio (with no pre-emphasis)

"0X100" Two-channel audio (those of 50/15microsec with pre-emphasis)

"0X010" Hold (for two-channel audios with pre-emphasis)

"0X110" Hold (for two-channel audios with pre-emphasis)

"0XXX1" Hold (for four-channel audios)

"1X000" Digital data "1X1XX" Hold "1XX1X" Hold "1XXX1" Hold "X0XXX" Ban on a digital copy (henceforth the ban on a copy)

"X1XXX" Digital copy authorization (henceforth copy authorization)

Moreover, the main things of the "category code" information on the above-mentioned

bit 8 - a bit 15 are defined as follows.

"00000000" General two-channel format "1 millionL" Two-channel CD player (CD)  
"0100000L" Two-channel PCM encoder decoder "11000001" Two-channel digital audio  
recorder (DAT) "1101000L" Two-channel digital video recorder (D. VTR)  
"L" which is LSB of the above-mentioned "category code" -- this bit -- "0" -- it is and it is  
shown that there is that it is in one condition of "1." For example, "11010001" shows  
"11010000" and "11010001."

[0018] Now, in recording on a tape the digital audio signal which suited the "digital  
audio interface" specification mentioned above with a serial copy management system  
(SCMS, Serial Copy Management System), it supplies DAT through the digital input  
terminal. Under the present circumstances, each information on a synchronous  
preamble, audio OGUJIRYARI, a validity flag, user data, the channel status, and a  
parity bit is also transmitted besides the original audio data stored in the audio sample  
WORD in a subframe.

[0019] And 8 bits (code which specifies a device) of category codes, the copy bit (the 2nd  
bit under "control") in the channel status Using "ban on copy" information ("0XXXX" =  
"0"), and 1 bit ("1XXXX" = "1") of "copy authorization" information, the copy data (an ID  
code, ID6) recorded on a tape are operated, and it changes into a condition possible  
[ record ] or unrecordable.

[0020] Now, now, the pattern of the ID code in DAT is the following three kinds.

"00" Any number of times are copy authorization "0". It is the ban "11" on a copy from  
now on. The category code and copy code of a digital audio signal which read this ID  
code and DAT itself outputs will be operated once from now on at the time of copy  
authorization playback. Namely, (1) When an ID code "00" is reproduced, they are  
category code = "11 million" and a copy bit. It considers as = "1" (copy authorization).  
(2) When an ID code "10" is reproduced, they are category code = "11 million" and a copy  
bit. It considers as = "0" (ban on a copy).  
(3) When an ID code "11" is reproduced, they are category code = "11000001" and a copy  
bit. It considers as = "0."

[0021] (1) described above when DAT tended to be connected and it was going to copy  
this - (3) from -- the ID code of the copy data judged and recorded is operated further,  
and it changes into a condition possible [ record ] or unrecordable. [ furthermore, ]

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EFFECT OF THE INVENTION

[Effect of the Invention] The digital audio play back system which becomes this  
invention has the effectiveness which can cancel that a digital audio signal may be  
unable to be copied to other devices by the SCMS method of DAT on condition of the  
above-mentioned digital audio interface specification.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the [Invention]] By the way, although using the ID code of the  
SCMS method correspondence DAT on condition of the above-mentioned digital audio  
interface specification as copy data was performed widely, by this approach, there was a  
case where a digital audio signal could not be copied to other devices from DAT.

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MEANS

[Means for Solving the Problem] In order to solve the above-mentioned technical problem, this invention offers the digital audio play back system of a configuration of carrying out the following.

[0024] The digital audio play back system which is a digital audio play back system which carries out record playback of the digital audio signal of digital audio interface specification, and is characterized by to operate different copy data from the copy data of the SCMS method which should be recorded on a record medium based on the category information and the copy information on said digital audio signal, and to operate said category information and copy information with said copy data at the time of playback at the time of record.

EXAMPLE

[Example] Hereafter, the digital audio play back system which becomes this invention is explained along with drawing 1 · drawing 15 . Drawing 1 is drawing explaining the digital copy of the digital audio play back system which becomes this invention.

[0026] The digital audio play back system which becomes this invention A profile, for example, the SCMS method of DAT mentioned above, is a different method. It is a copy method peculiar to the S-VHS method digital audio VTR. In 8 bits (bits 8-15) of category codes and 1 bit (bit 1 of the control bits) of copy codes contained in the channel status of the input signals like DAT at the time of digital signal record As copy data recorded on a tape, ID-7 of a S-VHS method digital audio and an ID code format are operated. Read the above-mentioned ID-7 currently recorded on the tape at the time of playback, and with the digital audio data according to digital audio interface specification to the exterior Following (1) - (3) The category code and copy code which are contained in the channel status reproduced by the playback condition of ID-7 which are copy data like are operated.

(1) When ID-7= "00" is reproduced, it is a category code = "11010000" (D. VTR) copy code. It considers as = "1" (copy authorization).  
(2) the case where ID-7="10" is reproduced .. category code = "11010000" and copy code It considers as = "0" (ban on a copy).  
(3) the case where ID-7="11" is reproduced .. category code = "11010001" and copy code It considers as = "0."

Here, 2 bits of the bits 7 and 6 in a SVHS method digital audio and an ID code format are used for ID-7.

[0027] Furthermore, it is (1) described above when DAT tended to be tied to this digital audio VTR and it was going to copy now. · (3) Judging from a condition, ID6 is operated further and it changes into a condition possible [ record ] or unrecordable.

[0028] Along with drawing 1 · drawing 2 , it explains having mentioned above further.

[0029] Drawing 1 shows the correspondence of ID-7 and a group recorded on the class of digital audio input signal (source), a category code, a copy code, and a tape.

[0030] The input signal (source) includes the category code and the copy code, and is reproduced from "GENERAL" (digital audio equipment, such as a new style broadcasting satellite tuner), the "undefined", "a semi-conductor recorder" (digital audio equipment using semiconductor memory), "BS" (satellite broadcasting service tuner), "DD CONVERTER and a PCM processor", "AD CONVERTER", "CD", "a digital musical

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instrument and a digital microphone", and "DAT." And this input signal (source) is classified into five groups of Group A - group D'. This classification is the same as that of the group whom DAT has classified according to SCMS in a category code.

[0031] A group is Group A (device of the category code of the undefined). They are corresponds to a new style broadcasting satellite tuner and drawing 3 ) of General, and ), and Group C (category codes are others [ VTR / DAT and / D.A.]) to drawing 2 . They are correspondence, Group D (category codes are others [ broadcasting satellite tuner / CD (it corresponds to drawing 7 and 8), and / old mold ], and group D' (device from which a copy prohibition bit changes [ a category code ] with "0", "1", "0", "1", and .. with CD.) to drawing 4 - drawing 6 R> 6. It is classified into illustration at drawing 9 .

[0032] Group A is copied as shown in drawing 2 .

[0033] As shown in this drawing (A), the category code of the input signal from the device of the undefined is a category code "00000100" (undefined)+ copy code "0" (ban on a copy). In case this is copied with the digital audio VTR of the next step (D. A.VTR), D.A.VTR records this signal, after setting to "11" (1-time copy authorization) ID-7 which are a copy code according to the condition of these category codes and copy codes. Then, when D.A.VTR reproduces ID-7 of "11" (1-time copy authorization), The signal of a category code "11010001" (D. VTR)+ copy code "0" (ban on a copy) is outputted. this .. the next step ... DAT .. copying .. the time ... DAT .. these .. a category .. a code .. a copy .. a code .. a condition .. responding .. a copy .. a code .. it is ... ID .. six .. " .. ten .. " (ban on a copy) ... \* \* .. having carried out .. a top .. this signal .. recording. Since the signal of a category code "11 million" (DAT)+ copy code "0" (ban on a copy) is outputted when Above DAT furthermore reproduces ID6 of "10" (ban on a copy) after this, it cannot copy in DAT which carries out direct continuation to this.

[0034] If it is made the circuitry which removed the above-mentioned D.A.VTR, as shown in this drawing (B), the signal from the device of the undefined can be copied only in DAT which carried out direct continuation to this.

[0035] Here, during the circuitry shown in this above-mentioned drawing (A), if the copy code of the signal from the device of the undefined is set to "1" (copy authorization) from "0" (ban on a copy), as shown in this drawing (C), a total of 1 time and two copies will be made to D.A.VTR and this in DAT which carries out direct continuation, respectively.

[0036] During the configuration which similarly is shown in this above-mentioned drawing (B), if the copy code of the signal from the device of the undefined is set to "1" (copy authorization) from "0" (ban on a copy), as shown in this drawing (D), it can copy only in DAT which carried out direct continuation to the device of the undefined. As

described above, by the SCMS method by the category code of the source carrying out direct continuation of the device and DAT of the undefined, it can copy only once by DAT, but if insertion connection of the D.A.VTR is made among both, it will be set possible to DAT/VTR by a unit of 1 time by DAT by total of two copying.

[0037] Group B is copied as shown in drawing 3 . Here, a new style broadcasting satellite tuner is explained as an example.

[0038] As shown in this drawing (A), the input signal from the broadcasting satellite tuner whose category code is General is a category code "00000000" (general two-channel format)+ copy code "0" (ban on a copy), and in case this is copied with D.A.VTR of the next step, D.A.VTR records this input signal, after setting ID-7 to "11" (1-time copy authorization). Then, when D.A.VTR reproduces ID-7 of "11" (1-time copy authorization), in case the signal of a category code "11010001" (D. VTR,P)+ copy code "0" (ban on a copy) is outputted and this is copied by DAT of the next step, DAT records this signal, after setting ID6 to "10" (ban on a copy). Since the signal of a category code "11 million" (DAT)+ copy code "0" (ban on a copy) is outputted when DAT furthermore reproduces ID6 of "10" (ban on a copy) after this, latter DAT cannot be copied.

[0039] In case the signal from a broadcasting satellite tuner will be copied by DAT which carries out direct continuation to this as shown in this drawing (B) if it is made the circuitry which removed the above-mentioned D.A.VTR, DAT records this signal, after setting ID6 to "11" (1-time copy authorization). Then, since the signal of a category code "11010001" (DAT)+ copy code "0" (ban on a copy) is outputted when DAT reproduces ID6 of "11" (1-time copy authorization), latter DAT records this signal, after setting ID6 to "10" (ban on a copy). Since the signal of a category code "11 million" (DAT)+ copy code "0" (ban on a copy) is outputted when latter DAT furthermore reproduces ID6 of "10" (ban on a copy) after this, DAT following this cannot be copied.

[0040] the copy code of the signal from the broadcasting satellite tuner shown in this above-mentioned drawing (A) and (B) here, respectively .. "0" (ban on a copy) to "1" (copy authorization) .. even if .. As shown in this drawing (C), a total of 1 time and two copies is made in DAT as D.A.VTR, respectively, and as shown in this drawing (D), only in DAT of the preceding paragraph, it can only copy.

[0041] Group C is copied as shown in drawing 4 and drawing 5 , respectively. Here, the case where DAT is used as the source is shown.

[0042] As shown in drawing 4 (A), the signal from DAT which a category code is DAT and is ID6 "10" (ban on a copy) is a category code "11 million" (DAT)+ copy code "0" (ban on a copy), and in case this is copied with D.A.VTR of the next step, D.A.VTR records this input signal, after setting ID-7 to "10" (ban on a copy). Then, since the signal of a

category code "11010000" (D. VTR)+ copy code "0" (ban on a copy) is outputted when D.A.VTR reproduces ID-7 of "10" (ban on a copy). DAT of the next step cannot be copied.

[0043] If it is made the circuitry which removed the above-mentioned D.A.VTR, as shown in this drawing (B), the signal from DAT cannot be copied by DAT by which direct continuation is carried out to this.

[0044] While setting to "00" (copy authorization) ID6 of DAT which is the source from "10" (ban on a copy) during the circuitry shown in this above-mentioned drawing (A) and (B) here, respectively If the copy code of the input signal from here is set to "1" (copy authorization) from "0" (ban on a copy), as shown in this drawing (C) and (D), respectively, a copy can do the output signal of DAT which is the source any number of times.

[0045] Similarly, a category code is DAT as shown in drawing 5 (A). The signal from DAT which is ID6 "1" (1-time copy authorization) is a category code "11000101" (DAT)+ copy code "0" (ban on a copy). In case this is copied with D.A.VTR of the next step, D.A.VTR records this input signal, after setting ID-7 to "11" (1-time copy authorization). Then, in case it copies by DAT of the next step since the signal of a category code "11010001" (D. VTR)+ copy code "0" (ban on a copy) is outputted when D.A.VTR reproduces ID-7 of "11" (1-time copy authorization), DAT records this signal, after setting ID6 to "10" (ban on a copy). Since the signal of a category code "11 million" (DAT)+ copy code "0" (ban on a copy) is outputted when DAT furthermore reproduces ID6 of "10" (ban on a copy) after this, latter DAT cannot be copied.

[0046] If it is made the circuitry which removed the above-mentioned D.A.VTR, as shown in this drawing (B), the signal from DAT which is a source side can only be copied by DAT by which direct continuation is carried out to this.

[0047] Here, when setting to "1" (copy authorization) the copy code of the signal from DAT which is ignorance [ ID6 of DAT which is during the circuitry shown in this above-mentioned drawing (A), and a source side ], and the source from "0" (ban on a copy), as shown in this drawing (C), a copy is made any number of times after the next step of this DAT.

[0048] During the configuration shown in this above-mentioned drawing (B), when setting to "1" (copy authorization) ignorance [ ID6 of DAT which is the source ], and the copy code of the signal of DAT from "0" (ban on a copy), as shown in this drawing (D), a copy is made any number of times in DAT.

[0049] Similarly, Group C is copied as shown in drawing 6.

[0050] As shown in this drawing (A), when D.A.VTR whose category code is D.VTR reproduces ID-7 of "10" (ban on a copy), The signal from here is a category code

"11010000" (D. VTR)+ copy code "0" (ban on a copy), and in case this is copied with D.A.VTR of the next step this D.A.VTR records this input signal, after setting ID-7 to "10" (ban on a copy). Then, when D.A.VTR reproduces ID-7 of "10" (ban on a copy), the signal of a category code "11010000" (D. VTR)+ copy code "0" (ban on a copy) is outputted, and this signal is recorded after D.A.VTR of the next step sets ID-7 to "10" (ban on a copy) for this. In this way, if the source is D.A.VTR, it can copy any number of times.

[0051] As shown in this drawing (B), when D.A.VTR reproduces ID-7 of "00" (copy authorization), the signal from here is a category code "11010000" (D. VTR)+ copy code "1" (copy authorization), and after ID-7 of D.A.VTR of the next step set this to "00" (ban on a copy), this input signal is recorded. Then, when D.A.VTR reproduces ID-7 of "00" (ban on a copy), the signal of a category code "11010000" (D. VTR)+ copy code "1" (copy authorization) is outputted, and this signal is recorded after D.A.VTR reproduces ID-7 of "00" (ban on a copy) for this. In this way, if the source is D.A.VTR, it can copy any number of times.

[0052] As shown in this drawing (C), when D.A.VTR reproduces ID-7 of "11" (1-time copy authorization), The signal from here is a category code "11010001" (D. VTR)+ copy code "0" (ban on a copy), and after ID-7 of D.A.VTR of the next step set this to "11" (1-time copy authorization), this input signal is recorded. Then, when D.A.VTR reproduces ID-7 of "11" (1-time copy authorization), the signal of a category code "11010001" (D. VTR)+ copy code "0" (ban on a copy) is outputted, and this signal is recorded after setting ID-7 to "11" (1-time copy authorization) for this with D.A.VTR of the next step. In this way, if the source is D.A.VTR, it can copy any number of times.

[0053] As shown in this drawing (D), ID-7 of D.A.VTR by the side of the source are unknown, this output signal is a category code "11010001" (D. VTR)+ copy code "1" (copy authorization), and after ID-7 of D.A.VTR of the next step set this to "00" (copy authorization), this input signal is recorded. Then, when D.A.VTR reproduces ID-7 of "00" (copy authorization), the signal of a category code "11010000" (D. VTR)+ copy code "1" (copy authorization) is outputted, and this signal is recorded after setting ID-7 to "00" (copy authorization) for this with D.A.VTR of the next step. In this way, if cascade connection of the D.A.VTR is carried out, it can copy any number of times.

[0054] If the source is D.A.VTR and all the devices following this are D.A.VTRs as described above, it can copy any number of times.

[0055] Group D is copied as shown in drawing 7.

[0056] As shown in this drawing (A), the signal from CD whose category code is CD is a category code "10 million" (CD)+ copy code "0" (ban on a copy), and in case this is copied

with D.A.VTR of the next step, D.A.VTR records this input signal, after setting ID-7 to "11" (1-time copy authorization). Then, when D.A.VTR reproduces ID-7 of "11" (1-time copy authorization), the signal of a category code "11010001" (D. VTR)+ copy code "0" (ban on a copy) is outputted, and this signal is recorded after setting ID6 to "10" (ban on a copy) for this by DAT of the next step. Since the signal of a category code "11 million" (DAT)+ copy code "0" (ban on a copy) is outputted when DAT furthermore reproduces ID6 of "10" (ban on a copy) after this, latter DAT cannot be copied.

[0057] If it is made the circuitry which removed the above-mentioned D.A.VTR, as shown in this drawing (B), the signal from CD will be copied only in DAT which carries out direct continuation to this.

[0058] Here, during the circuitry shown in this above-mentioned drawing (A) and (B), respectively, when the copy code of the signal from CD is set to "1" (copy authorization) from "0" (ban on a copy), as shown in this drawing (C) and (D), respectively, a copy is made any number of times.

[0059] Similarly, as shown in drawing 8 (A), the output signal from CD which is the category code CD is a category code "1000000" (CD)+ copy code "0" (ban on a copy), and in case this is copied with D.A.VTR of the next step, D.A.VTR records this input signal, after setting ID-7 to "10" (ban on a copy). Then, since the signal of a category code "11010000" (D. VTR)+ copy code "0" (ban on a copy) is outputted when D.A.VTR reproduces ID-7 of "10" (ban on a copy), latter DAT cannot be copied.

[0060] If it is made the circuitry which removed the above-mentioned D.A.VTR, as shown in this drawing (B), the signal from CD cannot be copied.

[0061] Here, during the circuitry shown in this above-mentioned drawing (A) and (B), respectively, if the copy code of the signal from CD is set to "1" (copy authorization) from "0" (ban on a copy), as shown in this drawing (C) and (D), respectively, it can copy any number of times.

[0062] Group D is copied as shown in drawing 9.

[0063] As shown in this drawing (A), the output signals from CD whose category code is CD are category code "10 million" (CD)+ "0", "1", "0", "1", .., a copy code that changes by 4.10Hz. In case this is copied with D.A.VTR of the next step, D.A.VTR records this input signal, after setting ID-7 to "10" (ban on a copy). Then, since the signal of a category code "11010000" (D. VTR)+ copy code "0" (ban on a copy) is outputted when D.A.VTR reproduces ID-7 of "10" (ban on a copy), latter DAT cannot be copied.

[0064] If it is made the circuitry which removed the above-mentioned D.A.VTR, as shown in this drawing (B), the signal from CD cannot be copied.

[0065] Below, above-mentioned S-VHS method digital audio and ID code format are explained.

[0066] Drawing in which drawing 10 shows track format, and drawing 11 are drawings explaining the sampling of an input audio signal.

[0067] As shown in drawing 10, voice data can distribute to the even audio track (lower layer of the video track of a channel 1) 7, and the odd audio track (lower layer of the video track of a channel 2) 8, and is recorded one by one in the direction of slant by turns to the direction of a tape feed by the BITEO head which is not illustrated on a tape 6.

[0068] As the even Audio truck 7 is shown in drawing 11, it consists of sample data E01, 000, E02, 010, and E03 which carried out the sequential sampling and obtained the input audio signal, the odd audio track 8 consists of sample data 002, E02, E03, E10, and 004, and the even Audio truck 9 consists of sample data E11, 010, E12, 011, and E13.

[0069] The 1 above-mentioned sample data consists of one subframes (from data DAT A and Q to a configuration) 10, and the one above-mentioned audio track consists of five subframes.

[0070] Drawing 12 is drawing showing the data format per one truck.

[0071] As shown in this drawing, each above-mentioned trucks 7 and 8 and above-mentioned 9 .. consist of 156 blocks ("preamble" 4 blocks, "data area" 150 block, "postamble" 2 block). "Data area" 150 blocks consists of five subframes. One subframe consists of 30 blocks. And the subframe concerning od sample data and the subframe concerning even sample data constitute one data frame.

[0072] Drawing 13 is drawing showing the data format per block.

[0073] In 30 block 0-0-29 which constitute one subframe as shown in this drawing The inside of the even block addresses 0-0, 0-2, .., 1 block which 0-28 becomes from 35 symbols (280 bits). One by one, it consists of "sink pattern (SYNC)" 1 symbol, "address (ADR) and W1" 1 symbol, "ID, W2" 1 symbol, "parity (PARITY) and P1" symbol, and "data" 31 symbol, respectively.

[0074] Moreover, it consists of "sink pattern (SYNC)" 1 symbol, "address (ADR) and W1" 1 symbol, "ID, W2" 1 symbol, "parity (PARITY) and P1" symbol, "data" 23 symbol, and "C1 parity" 8 symbol one by one, respectively among the odd block addresses 0-1, 0-3, .., 1 block which 0-29 becomes from 35 symbols (280 bits).

[0075] Drawing in which drawing 14 shows an ID code format, and drawing 15 are drawings showing the contents of a convention of ID-1-ID-10.

[0076] As shown in drawing 14, "the address (ADR) and W1" which were shown by drawing 13 consist of B7-B0, and "ID, W2" consist of B7-B0. [ 8-bit ] [ 8-bit ]

[0077] When "the address (ADR) and W1" (block address) are "XXXXX(s)000", ID-1 data (format convention data), its bit B5, and B4 of the bit B7 of "ID, W2" and B6 are the

contents of a convention of ID-2 data (sampling-frequency convention data).

[0078] Moreover, W1 It is W2 when it is "XXXXXX010". ID-3 data (channel convention data), its bit B5, and B4 of a bit B7 and B6 are the contents of a convention of ID-4 data (channel convention data).

[0079] ID-1 specifies a format and it is specified as the object for audios at the time of "00." As mentioned above, no matter the category code and copy code of the source may be in what condition, always is possible for the copy in D.A.VTR.

[0080] Moreover, if it is D.A.VTRs, a copy will become possible any number of times.

[0081] Furthermore, except for some category codes, DAT carries out actuation (actuation which records the same copy data on a tape when it cannot copy and copy improper and a copy are possible) same as a SCMS method to the same source by the case where it is going to copy to DAT directly, and the case where this tended to be reproduced and it is going to copy it to DAT once it copied to D.A.VTR.

[Drawing 7] It is drawing explaining Group's D digital copy.

[Drawing 8] It is drawing explaining Group's D digital copy.

[Drawing 9] It is drawing explaining the digital copy of group D.

[Drawing 10] It is drawing showing track format.

[Drawing 11] It is drawing explaining the sampling of an input audio signal.

[Drawing 12] It is drawing showing the data format per one track.

[Drawing 13] It is drawing showing the data format per block.

[Drawing 14] It is drawing showing an ID code format.

[Drawing 15] It is drawing showing each contents of a convention of ID-1.ID-10.

[Drawing 16] It is drawing explaining a format of the subframe in a digital audio interface.

[Drawing 17] It is drawing explaining a format of the frame in a digital audio interface.

[Drawing 18] It is drawing explaining the channel status data format in a digital audio interface.

[Description of Notations]

6 Tape

7 Nine Even audio track

8 Od Audio Track

[Translation done.]

[Translation done.]

\* NOTICES \*

JPO and NCIP are not responsible for any damages caused by the use of this translation.

1.This document has been translated by computer. So the translation may not reflect the original precisely.

2.\*\*\*\* shows the word which can not be translated.

3.In the drawings, any words are not translated.

## DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is drawing explaining the digital copy of the digital audio play back system which becomes this invention.

[Drawing 2] It is drawing explaining Group's A digital copy.

[Drawing 3] It is drawing explaining Group's B digital copy.

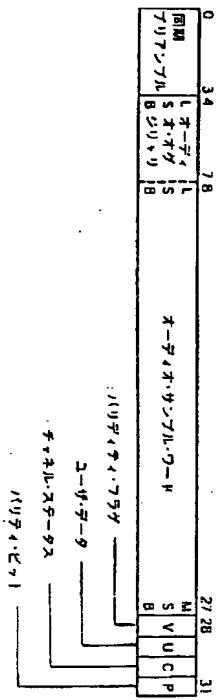
[Drawing 4] It is drawing explaining Group's C digital copy.

[Drawing 5] It is drawing explaining Group's C digital copy.

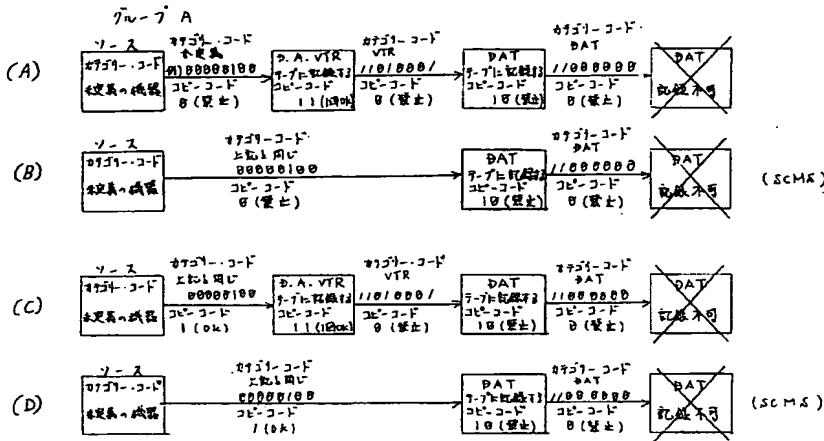
[Drawing 6] It is drawing explaining Group's C digital copy.



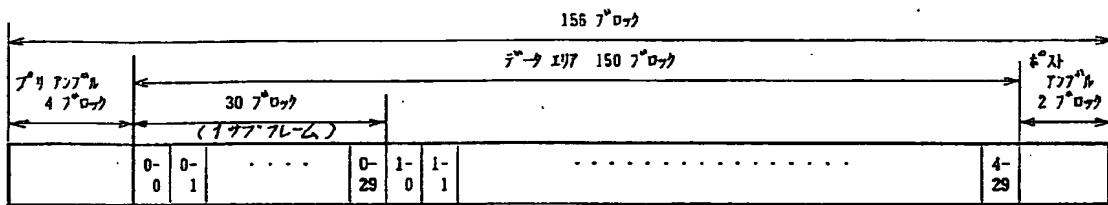
[Drawing 16]



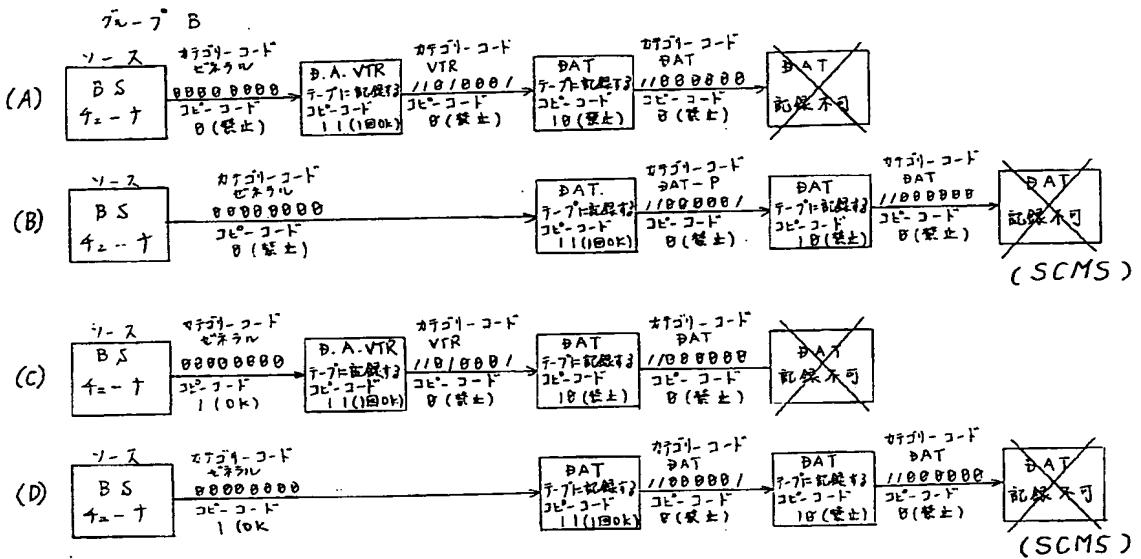
[Drawing 21]



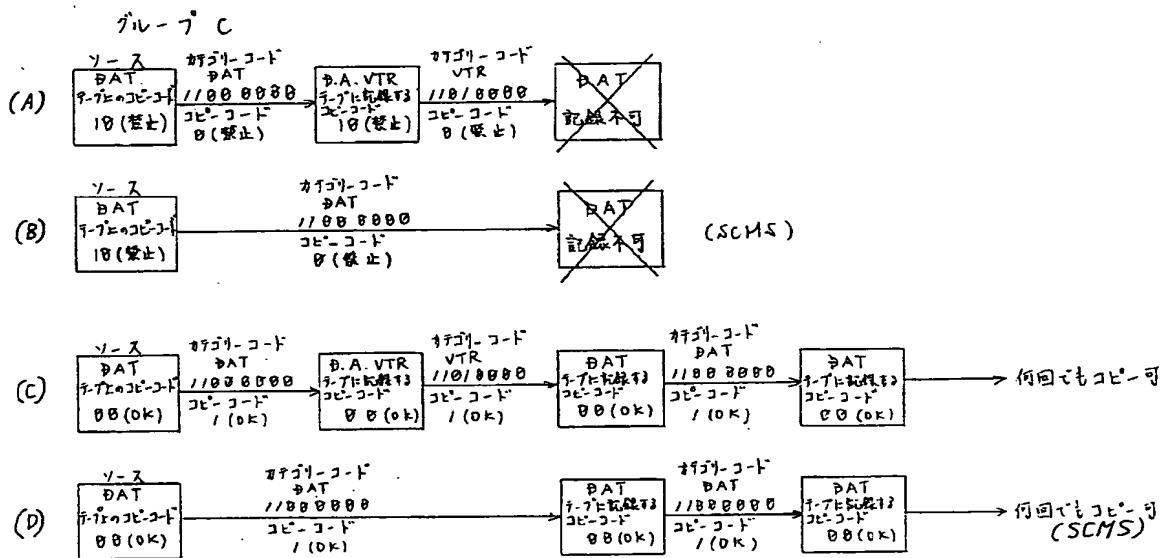
[Drawing 12]



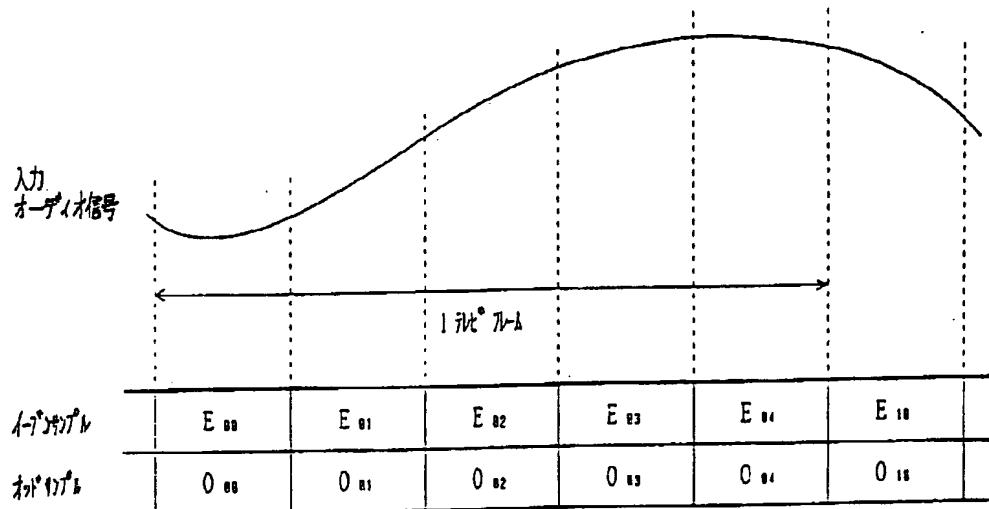
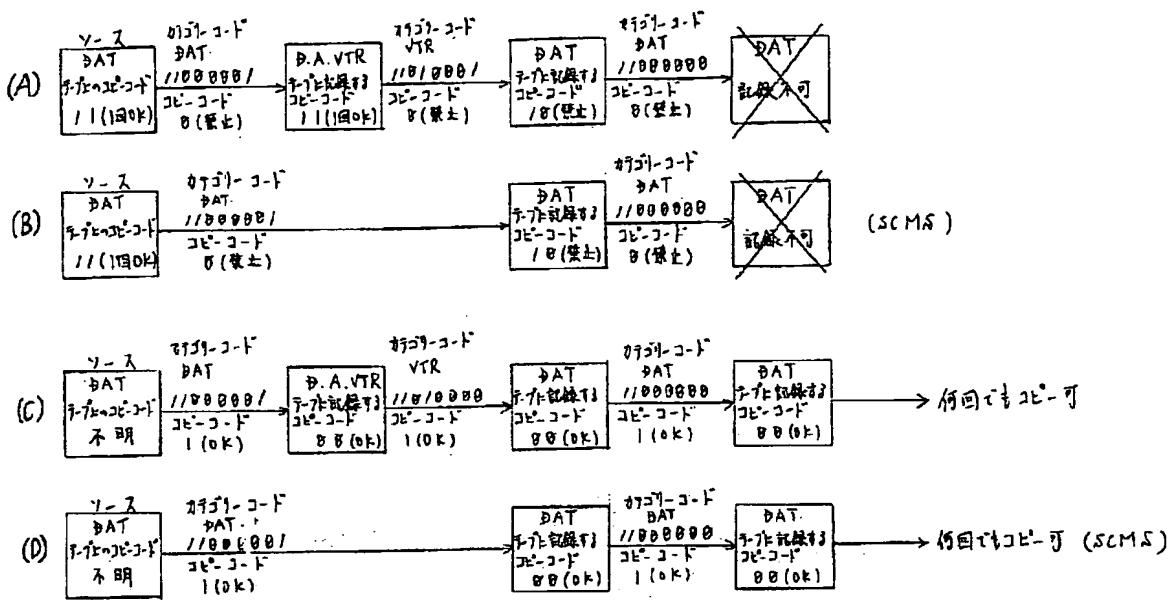
[Drawing 3]



[Drawing 4]

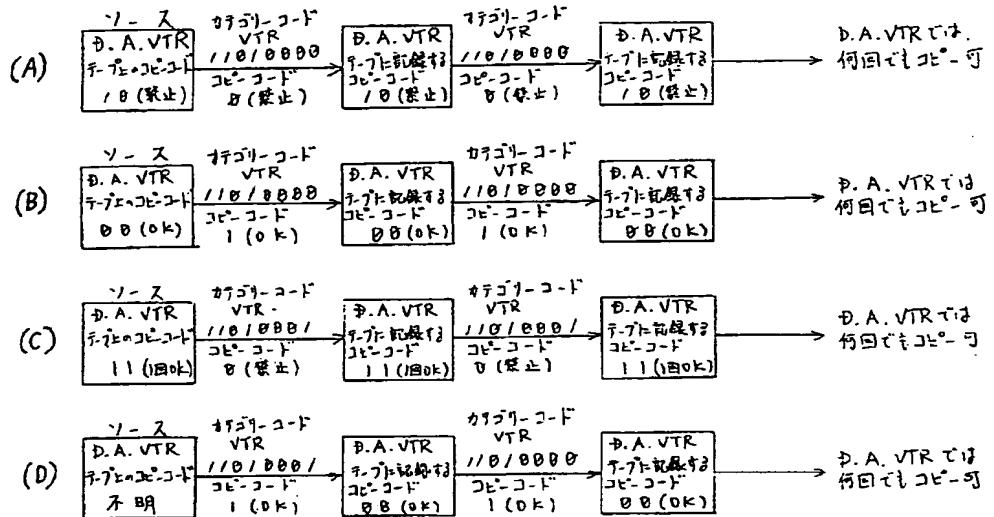


## 41L-7°C



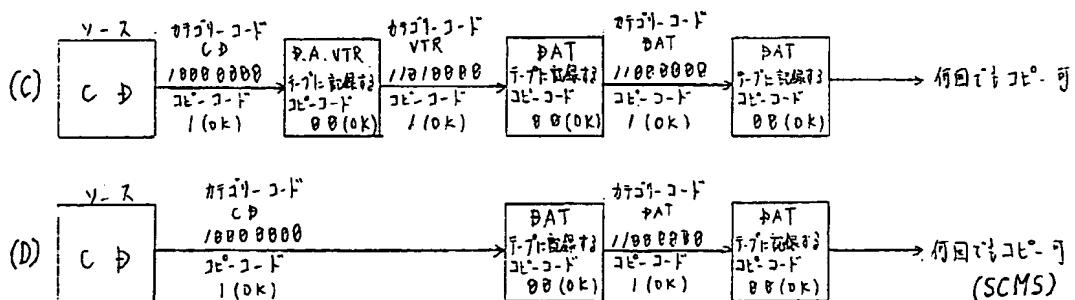
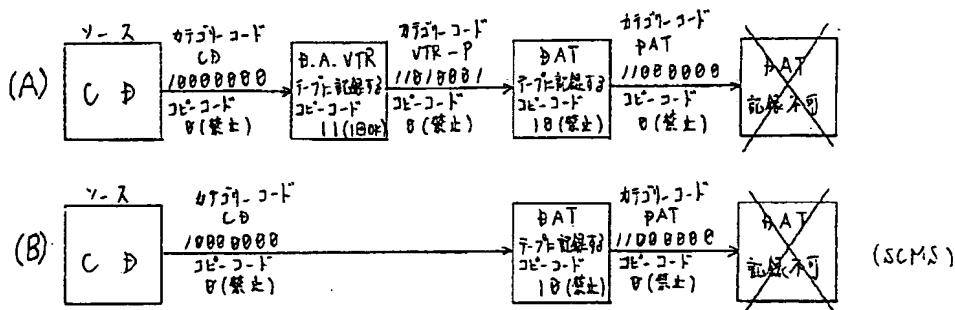
クル-7°C

[Drawing 6]

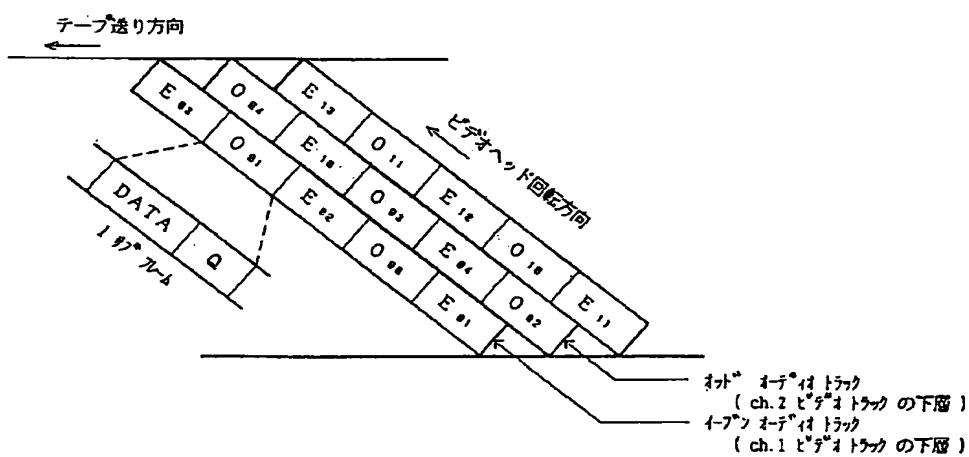
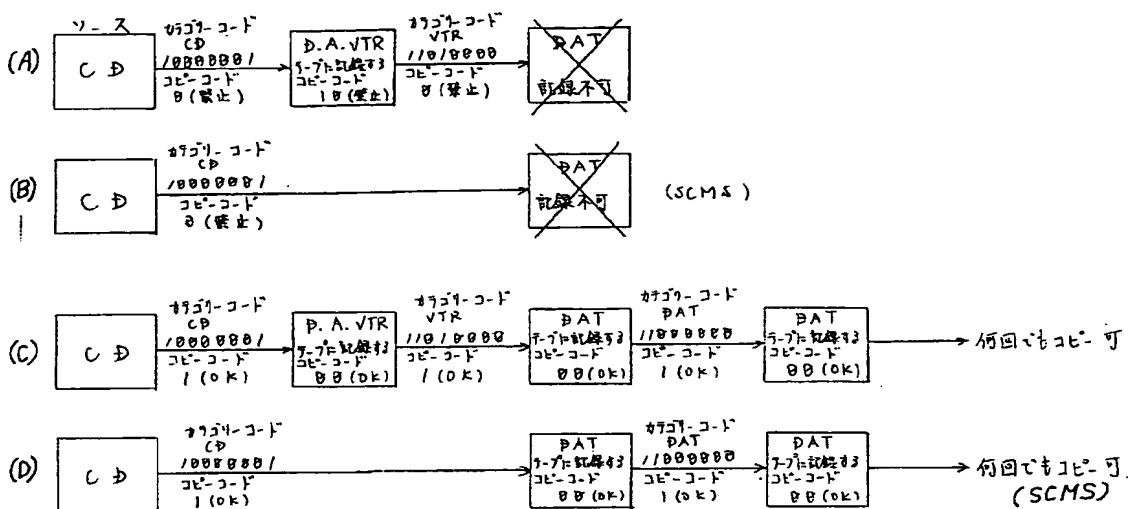


クル-7° D

[Drawing 7]



## グルーブ D



Drawing 14]

W <sub>1</sub> (7" リング付) <sup>*</sup>								W <sub>2</sub> (1D)							
B7	B6	B5	B4	B3	B2	B1	B0	B7	B6	B5	B4	B3	B2	B1	B0
X	X	X	X	0	0	0	0	1D-1		1D-2	1D-9	フレームアドレス			
1	0	0	1												
1	0	1	0	1D-3		1D-4		1D-10		フレームアドレス					
1	0	1	1												
1	1	0	0	1D-5		1D-6		1D-9		フレームアドレス					
1	1	0	1												
1	1	1	0	1D-7		1D-8		1D-10		フレームアドレス					
1	1	1	1												
LSB															

LSB LSD

Drawing 15]

Drawing 15]

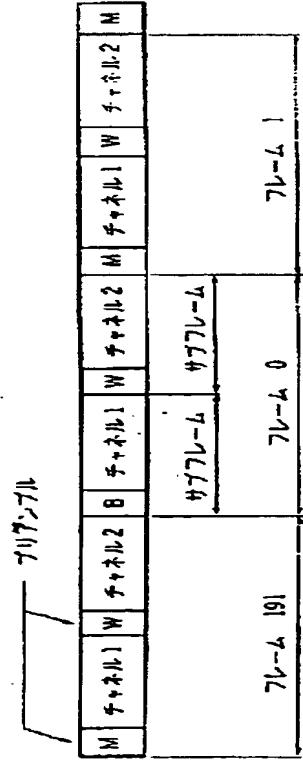
1D-1(リード)		1D-2~1D-10		内 密	
(4-747)		II-2 (機械化監視)		00:48kHz (時間モード) 01:32kHz 10:16kHz (時間モード) 11:半周逆	
II-3					
II-4					
II-5 (1777A)					
II-6					
II-7 (7-1777A-1)					
II-8					
II-9					
II-10					

1D-1、2、3、4、5、7のそれぞれは、同一テレビフレーム内で出回していること。  
 1D-8は、同一サブフレーム内で同じであること。  
 1D-10の「初期開始及び終了」は、クロスフェードサブフレームを含むデータフレームに適用すること。

Drawing 16]

0	0	コントロール	チャネル番号	サンプリング周波数	クロック周波数	0	0
32		コード・ワーク		N <sub>1</sub>	N <sub>2</sub>		
48	N <sub>3</sub>		N <sub>4</sub>		N <sub>5</sub>	N <sub>6</sub>	
64	N <sub>7</sub>		N <sub>8</sub>		N <sub>9</sub>	N <sub>10</sub>	
80	N <sub>11</sub>		N <sub>12</sub>		N <sub>13</sub>	0	0
96	0	0	0	0	0	0	0
112	0	0	0	1 <sub>1</sub>	1 <sub>2</sub>		
128		1 <sub>3</sub>		L <sub>1</sub>		1 <sub>5</sub>	
144	b <sub>1</sub>	0	0	b <sub>2</sub>	1 <sub>6</sub>		b <sub>4</sub>
160	b <sub>5</sub>			1 <sub>10</sub>	1 <sub>11</sub>		1 <sub>12</sub>
176	0	0	0	0	0	0	0

Drawing 17]



→ヨウリカクアタ−ト

Drawing 18]

0	0	コントロール	チャネル番号	サンプリング周波数	クロック周波数	0	0
32		コード・ワーク		N <sub>1</sub>	N <sub>2</sub>		
48	N <sub>3</sub>		N <sub>4</sub>		N <sub>5</sub>	N <sub>6</sub>	
64	N <sub>7</sub>		N <sub>8</sub>		N <sub>9</sub>	N <sub>10</sub>	
80	N <sub>11</sub>		N <sub>12</sub>		N <sub>13</sub>	0	0
96	0	0	0	0	0	0	0
112	0	0	0	1 <sub>1</sub>	1 <sub>2</sub>		
128		1 <sub>3</sub>		L <sub>1</sub>		1 <sub>5</sub>	
144	b <sub>1</sub>	0	0	b <sub>2</sub>	1 <sub>6</sub>		b <sub>4</sub>
160	b <sub>5</sub>			1 <sub>10</sub>	1 <sub>11</sub>		1 <sub>12</sub>
176	0	0	0	0	0	0	0

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[Translation done.]